MAL'TSEV, A.I.

Constructive algebras. Part 1. Usp.mat.nauk 16 no.3:3-60 My-Je '61. (MIRA 14:8)

(Algebra)

MAL'TSEV, A.I.

Remark on the article "Unsolvability of elementary theories of certain fields." Sib. mat. zhur. 2 no.4:639 Jl-Ag '61. (MIRA 14:9)

(Fields, Algebraic)

On Free Soluble Groups

67903
SOV/20-130-3-3/63

if for its elements from $x^m = y^m$ $(m \neq 0)$ it follows $x = y$.

Theorem 2 : If the factor group F/A of the free group F with respect to its normal subgroup A is an R-group, then $F_o = F/[A,A]$ is also an R-group.

Conclusion : All free soluble groups are R-groups.

Theorem 3 contains the above mentioned statement on the insolubility of the elementary theories of the free n-stage soluble noncommutative groups.

There are 3 references, 1 of which is Soviet, 1 Dutch, and 1 American.

SUBMITTED: November 11, 1959

Card 2/2

67903

SOV/20-130-3-3/65

~~16(1)~~ 16 2000

AUTHOR: Mal'tsev, A.I. Academician

TITLE: On Free Soluble Groups

PERIODICAL: Doklady Akademii nauk SSSR,1960,Vol 130,Nr 3,pp 495-498(USSR)

ABSTRACT: Groups which are isomorphic to the factor group $F/F^{(n)}$ of a free group F with respect to their n-th commutant are called free n-stage soluble groups. In the paper the author investigates properties of these groups with the aid of which he then proves that the elementary theories of the free n-stage soluble noncommutative groups are recurrently unsoluble in the sense of Tarski [Ref 1]. Theorem 1 : Let A be a normal subgroup of a free group F, such that F/A is free of torsion. Then arbitrary commutating elements u,v of the group $F_0 = F/[A,A]$ are either contained in $A_0 = A/[A,A]$ or they are powers of the same element of F_0. The theorem is proved with the aid of the results of Auslander and Lyndon [Ref 2]. According to Kantorovich [Ref 3] a group is called R-group,

Card 1/2

MAL'TSEV, A.I. (Moskva)

One of the correspondences between rings and groups. Mat. sbor. 50 no.3:257-266 Mr '60. (MIRA 13:6)
(Groups, Theory of)

MAL'TSEV, A.I.

Insolubility of elementary theories of some fields. Sib.mat. zhur. 1 no.1:71-77 My-Je '60. (MIRA 13:11)
(Fields, Algebraic)

On Small Models

SOV/20-127-2-6/70

least for countable and finite models can not be dropped.
Let K be a class of models, α, β be cardinal numbers. Let $K_\alpha, K^\beta, K^\beta_\alpha$ be classes of K-models the cardinality m of which satisfies the conditions $\alpha \leq m, m \leq \beta$, $\alpha \leq m \leq \beta$.
Theorem: Let K, L be axiomatizable classes of models of the same type. For a certain infinite cardinal number α let $K^\alpha_\alpha \subset L$. Then $K_{\aleph_0} \subset L$ if α is not smaller than the order of K, and $K^\alpha_{\aleph_0} \subset L$ in other cases.
There are 4 references, 2 of which are Soviet, 1 German, and 1 Dutch.

SUBMITTED: April 18, 1959

Card 2/2

16(1)
AUTHOR: Mal'tsev, A.I., Academician

SOV/20-127-2-6/70

TITLE: On Small Models

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 258-261 (USSR)

ABSTRACT: Let K be the class of all models $\mathfrak{M} = \langle M, \{P_i\}, \{a_j\} \rangle$ satisfying a certain axiom system of the restricted predicate calculus. The total number of the symbols P_i and a_j (predicates and individual elements) is called order and the cardinality of the set M is called cardinality of $\mathfrak{M}$. Models, the cardinality of which is not smaller than the order and simultaneously finite, are called regular. All other models are called small. The author considers specialities which can appear in connection with extensions of small models, and some questions combined herewith.
Theorem: If the axiomatizable class K contains a model $\mathfrak{M}$ with an infinite cardinality m, then $\mathfrak{M}$ has a K-extension with the cardinality $m^{\aleph_0}$. If K contains models of the cardinalities $m_1 < m_2 < \dots$, then K also contains a model of the cardinality m, where $m_1 + m_2 + \dots \leq m \leq m_1 \cdot m_2 \dots$.
By examples it is shown that the limits given in the theorem, at

Card 1/2

16(1) SOV/38-23-4-1/8

AUTHOR: Mal'tsev, A.I.

TITLE: Regular Products of Models

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1959, Vol 23, Nr 4, pp 489-502 (USSR)

ABSTRACT: By introducing the notion of a regular product the author generalizes the notion of the direct product of models. For regular products he proves properties containing the well-known results of Vaught and Mostowski on direct products as special cases. The consideration starts from the special model relations introduced by the author in [Ref 5]. Altogether there are given 4 theorems and several conclusions. There are 8 references, 3 of which are Soviet, 2 American, 2 Dutch, and 1 Polish.

SUBMITTED: January 2, 1959

Card 1/1

SOV/38-23-3-1/6

16(1)

AUTHOR: Mal'tsev, A.I.

TITLE: Model Correspondences

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1959, Vol 23, Nr 3, pp 313-336 (USSR)

ABSTRACT: The author investigates the model correspondences (projective correspondences) connected very tightly with the restricted predicate calculus. For more complicated correspondences the author proves the inner local theorem, the special cases of which are the fundamental local theorems of the theory of groups. Eight theorems and many definitions, conclusions, and applications are given. The most essential results of the paper are already published without proofs [Ref 12]. There are 18 references, 7 of which are Soviet, 2 Polish, 3 Dutch, 4 German, and 2 American.

SUBMITTED: November 27, 1958

Card 1/1

AUTHOR: Mal'tsev, A.I., Academician

TITLE: On Some Model Classes (O nekotorykh klassakh modeley)

SOV/20-120-2-5/6

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 2, pp 245-248 (USSR)

ABSTRACT: In an earlier paper [Ref 1] the author gave a structural characteristic of quasi-free classes of algebras. Using this result, in the present paper the author treats the structural characteristics of universally axiomatisable model classes and of quasiprimitive classes of algebras. Thereby at the same time the question in [Ref 2] about a purely algebraic characterization of quasiprimitive classes of algebraic systems is answered. Finally it is shown that the quasiprimitive classes of algebraic systems are the single (up to structural equivalence) homomorphically axiomatizable closed model classes which admit a theory of defining relations in the sense of the author [Ref 3]. The paper contains a great number of definitions and eight theorems and lemmas.
There are 12 references, 6 of which are Soviet, 5 American, 1 Polish and 1 Japanese.

SUBMITTED: February 20, 1958

Card 1/1

1. Algebra

Structural Characteristic of Some Classes of Algebras SOV/20-120-1-6/63

The structure categories K_1 and K_2 are denoted structurally equivalent, if there exists a rule Ψ according to which it is possible to construct uniquely to each K_1- structure a K_2- structure with the same basic set, where each homomorphism of the K_1- structure $\mathfrak{A}$ into the K_1- structure $\mathfrak{L}$ is a homomorphism of $\mathfrak{A}^{\Psi}$ into $\mathfrak{L}^{\Psi}$, and if there exists a corresponding inverse rule. There are 5 references, 3 of which are Soviet, and 2 American.

SUBMITTED: February 6, 1958

1. Algebra--Theory

Card 2/2

of Sciences, USSR

AUTHOR: Mal'tsev, A.I., Member of the Academy/ SOV/20-120-1-6/63

TITLE: Structural Characteristic of Some Classes of Algebras (Strukturnaya kharakteristika nekotorykh klassov algebr)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 120, Nr 1, pp 29-32 (USSR)

ABSTRACT: In addition to his last publication [Ref 2] the author considers categories of structures, and besides of the general isomorphism a special kind of it, the structural equivalence. He restricts himself to categories of structures with strong substructures, i.e. to those categories in which the homomorphism into the substructure is a homomorphism into the structure. Besides of the notions already introduced in [Ref 2] a large number of new notions is introduced and six theorems are proved. The main result of the paper is the establishment of the conditions which the category of structures must satisfy in order that it be structurally equivalent to a certain subclass of a certain class of algebras. The corresponding theorem is:
Theorem: In order that the structure category K be structurally equivalent to a quasi-free subclass of the category of all algebras of a certain fixed type, it is necessary and sufficient that K contains the unit structure, is homomorphic in itself and multiplicatively closed and that it is regular, bounded and additive.

Card 1/2

The Defining Relations in Categories

all direct compositions be separable, in every K- structure $\mathfrak{A}_\alpha (\alpha \in \Gamma)$ let be chosen a K- structure $\mathfrak{B}_\alpha$ and let exist the direct compositions $\mathfrak{A} = \prod \mathfrak{A}_\alpha$ and $\mathfrak{B} = \prod \mathfrak{B}_\alpha$. Then $\mathfrak{B}$ is a substructure of $\mathfrak{A}$.
A further theorem gives necessary and sufficient conditions that all canonic homomorphisms of the K- structures into their K-free compositions are isomorphisms onto corresponding substructures.
The author formulates some further notions and three further theorems on categories are announced.
Finally the author transfers these general assertions to model categories treated by the author in an earlier paper [Ref 1].
There are 5 references, 2 of which are Soviet, 2 American, and 1 Canadian.

SUBMITTED: January 29, 1958

Card 2/2

20-119-6-10/56

AUTHOR: Mal'tsev, A.I., Academician

TITLE: The Defining Relations in Categories (Opredelyayushchiye sootnosheniya v kategoriyakh)

PERIODICAL: Doklady Akademii nauk SSSR,1958,Vol 119,Nr 6,pp 1095-1098(USSR)

ABSTRACT: The present investigation joins a paper of the author [Ref 1] on subdirect model products published two years ago. The aim of the paper is the transfer of the theory of defining relations to model classes. According to Eilenberg [Ref 2] and MacLane [Ref 3] the author introduces the notions of the category, the object, the direct composition, the K-free composition etc. The subcategory L of the category K is a subclass of the object class of K with all homomorphisms of K belonging to all possible pairs of L- objects. Then structure categories are introduced as in the papers of Isbell [Ref 4] or MacLane [Ref 3]. The substructure $\mathfrak{B}$ of the structure $\mathfrak{A}$ is called a strong substructure, if every homomorphism in $\mathfrak{B}$ is a homomorphism in $\mathfrak{A}$. The direct composition $\mathfrak{A}$ of the structure systems $\mathfrak{A}_\alpha$ is called separable, if from the assertion "$a\pi_\alpha = b\pi_\alpha$ for all canonical homomorphisms $\pi_\alpha (\alpha \in G)$" it follows $a = b$ $(a,b \in \mathfrak{A})$.

Theorem: Let all substructures of the category K be strong, let

Card 1/2

On Homomorphisms Onto Finite Groups

group is called bounded if it contains at least one finite normal series with bounded Abelian factors.
A solvable group free of torsion with finitely separable subgroups is bounded. Bounded solvable groups have finitely separable subgroups.
Let the class of algebras K be defined by a finite number of axioms of the restricted predicate calculus. Let A be an algebra of K with finitely many generating and defining relations. If in A all subalgebras are finitely separable, then the question whether an element belongs to a subalgebra can be solved algorithmically for A.

Card 3/3

On Homomorphisms Onto Finite Groups

subgroups bases on the following assertions:
1. Let the class K contain homomorphic images of the subalgebras of the algebra of K. If all congruences on the algebra A are exchangeable and A has K-separable subalgebras, then also all homomorphic images of A have K-separable subalgebras.
2. Let K be a class of groups or rings containing the direct products of arbitrary pairs of its algebras. Then the direct product of a finite number of algebras with K-separable subalgebras is an algebra with K-separable subalgebras.
An Abelian group free of torsion is called bounded if its rank is finite and if for an arbitrary element a and an arbitrary subgroup B which does not contain a, the congruence $xp^n = a(B)$, p - prime number, is solvable only for finitely many n. An Abelian group A has finitely separable subgroups then and only then if the factor group of A is bounded with respect to its periodic part F and the orders of the elements of every primary component of F are bounded.
An Abelian group is called bounded if the primary components of its periodic part F is bounded and free of torsion. A solvable

SOV/42-13-3-25/41

AUTHOR: Mal'tsev, A.I. (Ivanovo)

TITLE: On Homomorphisms Onto Finite Groups (O gomomorfizmakh na konechnyye gruppy)

PERIODICAL: Uspekhi matematicheskikh nauk, 1958, Vol 13, Nr 3, pp 237-238 (USSR)

ABSTRACT: Let K be a class of abstract algebras. The algebra A is called K-approximateable if for $a,b \in A$, $a \neq b$, there exists a homomorphism of A into a suitable K-algebra so that the images of a and b are different too. A subalgebra $B \subseteq A$ is called K-separable of the element $a \in A$ if there exists a homomorphism σ of A into a suitable K-algebra for which $a^\sigma \notin B^\sigma$. A is called an algebra with K-separable subalgebras if every subalgebra of A is K-separable for every element not belonging to A. If K is the set of all finite algebras, then one obtains finite approximate-ability and finite separability. The semidirect product of a finitely approximateable subgroup and a finitely approximateable normal divisor with finitely many generators is a finitely approximateable group. Abelian semigroups with finitely many generating elements and all rings being free in classes which are characterized by polylinear identities, are finitely approximateable.
The investigation of solvable groups with finitely separable

Card 1/3

MAL'TSEV A.I.

AUTHOR: MAL'TSEV A.I., Corresponding Member, Acad. of Sci. USSR 20-5-6/48

TITLE: On Model Classes With the Generating Operation. (O klassakh modeley s operatsiey porozhdeniya)

PERIODICAL: Doklady Akad. Nauk SSSR, 1957, Vol. 116, Nr. 5, pp. 738-741 (USSR)

ABSTRACT: The model class K is denoted to be pseudoaxiomatizable if 1) from the validity of a part of an axiom system of the restricted predicate calculus there follows the validity of the whole system in the corresponding model. 2) to every cardinal number $\mathfrak{m}$ there exists a cardinal number $\mathfrak{n}(\mathfrak{m})$ such that every K-model which contains a system of elements S of the cardinality $\mathfrak{m}$ has a K-submodel of the cardinality $\mathfrak{n}$ which also contains the elements of S. E.g. the PC_{Δ}-classes of Tarski are pseudo-axiomatizable.
Principal theorem: Every pseudoaxiomatizable model class K with a natural generation can be axiomatized and namely therefore axioms of the Skolem type [Ref.4] are sufficient.
One Soviet and 3 foreign references are quoted.

SUBMITTED: June 15, 1957
AVAILABLE: Library of Congress

Card 1/1

On Derivative Operations and Predicates 20-1-6/44

The general form of these operations is given. Then an abstract characteristic of the predicates is given which can be represented by conjunctions of the universal formulas of the restricted predicate calculus. The obtained results are used to obtain the general form of the derivative operations (under some additional assumptions).
Altogether the paper contains 5 theorems which partly contain earlier results of Robinson [Ref.2 ,3] and Tarski [Ref.4] as special cases.

SUBMITTED: March 14, 1957
AVAILABLE: Library of Congress

Card 2/2

MAL'TSEV A.I.

20-1-6/44

AUTHOR: MAL'TSEV A.I., Corresponding Member, AN USSR

TITLE: On Derivative Operations and Predicates (O proizvodnykh operatsiyakh i predikatakh).

PERIODICAL: Doklady Akad. Nauk SSSR, 1957, Vol.116, Nr.1, pp.24-27 (USSR)

ABSTRACT: Let A be an algebra with the fundamental operations $f_i(x_1,\dots x_{m_i})$ $i=1,2,\dots$. The fundamental type of the derivative operations defined on A is formed by the terms and the polynomials. But the operations f_i can also be comprehended as predicates $P_i(x_1,..,x_{m_i},y)$ defined on A and mean $f_i(x_1,\dots x_{m_i}) = y$. Every correctly built formula $\mathfrak{A}(x_1,\dots,x_n)$ of the restricted predicate calculus which is formed by the predicate symbols P_i and which contains the free variables $x_1,\dots,x_n$, can be comprehended as a derivative predicate on A. In the above mentioned sense $\mathfrak{A}$ can represent an operation on A. Therewith there arises a new possibility for the establishment of new operations on A.
At first the general operations are considered which can be obtained in a class of algebras (characterised by universal axioms) with the aid of formulas of the restricted predicate calculus.

Card 1/2

(cf. Mal'cev, Mat.Sbornik,n.Ser. 35, 3-20 (1954)). For obtaining a free topology the author constructs a certain transfinite sequence of topologies X_λ ($\lambda \leqslant \tau$). The question, which values τ may have for free groups over completely regular spaces, is not answered. Then Graev's theorem on the free topology of the groups over a bicompact space are proved for arbitrary algebras. For algebras with a locally compact generating space a free topology is given. It is proved that free nilpotent topological groups of different stages are factor groups of a free topological group with respect to corresponding terms of their lower central series. The author considers the algebraic structure of free topological rings, among them non-associative rings, Lie rings etc. Several special cases are investigated in detail.

MAL'TSEV, A.I.

CARD 1/2 PG - 906

SUBJECT USSR/MATHEMATICS/Topology
AUTHOR MAL'CEV A.I.
TITLE Free topological algebras.
PERIODICAL Izvestija Akad.Nauk 21, 171-198 (1957)
reviewed 7/1957

The fact that free abstract groups, rings etc. can be treated most natural by virtue of a general theory of algebraic systems, induces the author to represent systematically the foundations of a theory of free topologized algebraic systems. With respect to the contents the present paper is in close connection with the investigations of Markov (Izvestija Akad.Nauk 9, 3-64 (1945)), Graev (Izvestija Akad.Nauk 12, 279-324 (1948); ibid. 14, 343-354 (1950)), Nakayama (Proc.Imp.Acad.Tokyo 19, 471-475 (1943)), Kakutani (Proc.Imp.Acad.Tokyo 20, 595-598 (1944)). An algebra is a universal algebra in the sense of Birkhoff. At first a topological algebra with a given generating topological space and a given system of relations is defined. There follow proofs of existence and uniqueness. At the same time it is proved that a topological algebra which is defined over a topological space by a system of relations is generated finitely by the elements of this space. Then the author refers to the exceptional situation of the algebras with commutating congruences in the theory of the free topological algebras

MAL'TSEV, A. I.

USSR/Mathematics - Modern Algebra 21 May 53

"Multiplicative Comparisons of Matrices," A. I. Mal'tsev

DAN SSSR, Vol 90, No 3, pp 333-335

States that subject problem is to find, for matrices F_n^r (namely, the set of all matrices from the associative system of all square matrices F_n of given order n with elements from a given field F relative to action of matrix multiplication, whose [i.e., first matrices] ranks do not exceed a given number r),

260T73

all comparison relations that are reflexive, symmetrical, transitive, and that maintain both right and left multiplication with arbitrary matrix from F_n^r. Presented by Acad A. N. Kolmogorov 26 Mar 53.

MAL'TSEV, A. I.

Mathematical Reviews
Vol. 14 No. 9
October 1953
Algebra

Mal'cev, A. I. On a class of algebraic systems. Uspehi Matem. Nauk (N.S.) 8, no. 1(53), 165–171 (1953). (Russian)

Observing the existence of certain parallel results in group theory and ring theory, the author proposes a unification via the concept of a quasi-ring. There are to be two operations, the elements forming a (not necessarily abelian) group under $+$ and satisfying $x+y=y+x+D_1(x, y)$, $x(y+z)=xy+xz+D_2(x, y, z)$, $(x+y)z=xz+yz+D_3(x, y, z)$, $x\cdot 0=0\cdot x=0$. Here the D's are "polynomials" (sums of products of the elements or their inverses). The case of a ring is that where the D's are all 0. To cover the case of a group we define xy to be the commutator, set $D_1=xy$ and D_2, D_3 the appropriate expressions. The author takes up the following topics: homomorphisms, ideals, the descending central series, and quasi-rings satisfying identical relations.

I. Kaplansky (Chicago, Ill.).

USSR/Mathematics - Modern Algebra, Groupoids

Jul/Aug 52

"Symmetrical Groupoids," A.I. Mal'tsev, Moscow

"Matemat Sbor" Vol XXXI (73), No 1, pp 136-151

A set of elements G is called a groupoid if a uniquely detd element c in G (called the product of a and b and designated by ab) is established in correspondence to each ordered pair a,b of its elements. In current article the author considers the simplest properties of sym groupoids both finite and also infinite: right zeros, automorphisms, and homomorphisms. The set of all transformations of set M is an associative groupoid, which is called sym. Submitted 3 Mar 52.

220T80

MAL'TSEV, A. I.

[illegible] On a representation of nonassociative rings. Uspehi Matem. Nauk (N.S.) 7, no. 1(47), 1[illegible]-185 (1952). (Russian)

Consider an associative algebra under the new operation [illegible] where [illegible] is fixed. Theorem 1 asserts that an arbitrary non-associative algebra can be exhibited as a o-subalgebra of a suitable associative algebra. One first observes (Theorem 1) that the free associative algebra generated by o and x gives rise to a free non-associative algebra under o, and then studies reduction modulo an ideal. Theorem 3: Any associative algebra of countable dimension can be embedded in an algebra with two generators. This theorem is unrelated but is proved by similar techniques.

I. Kaplansky (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 13 No. 9

MAL'TSEV, A. I.

USSR/Mathematics - Group Theory May/Jun 51

"Concerning Certain Classes of Infinite Soluble Groups," A. I. Mal'tsev, Moscow

"Matemat Sbor" Vol XXVIII, No 3, pp 567-588

Discusses wider classes of sol groups. Solves number of problems on their properties and investigates conditions for which soly of groups under study proceeds from local soly. Cf. K. A. Hirsch, "On Infinite Soluble Groups" I, II, III, "Proc London Math Soc" 44, 1938, 53-60, 336-344; 49, 1946, 184-194. Cf. Kolchin, "On Certain Concepts in the Theory of Algebraic Matric Groups," "Ann of Math" 49, 1948. 774-489. Submitted 17 Nov 49.

186T57

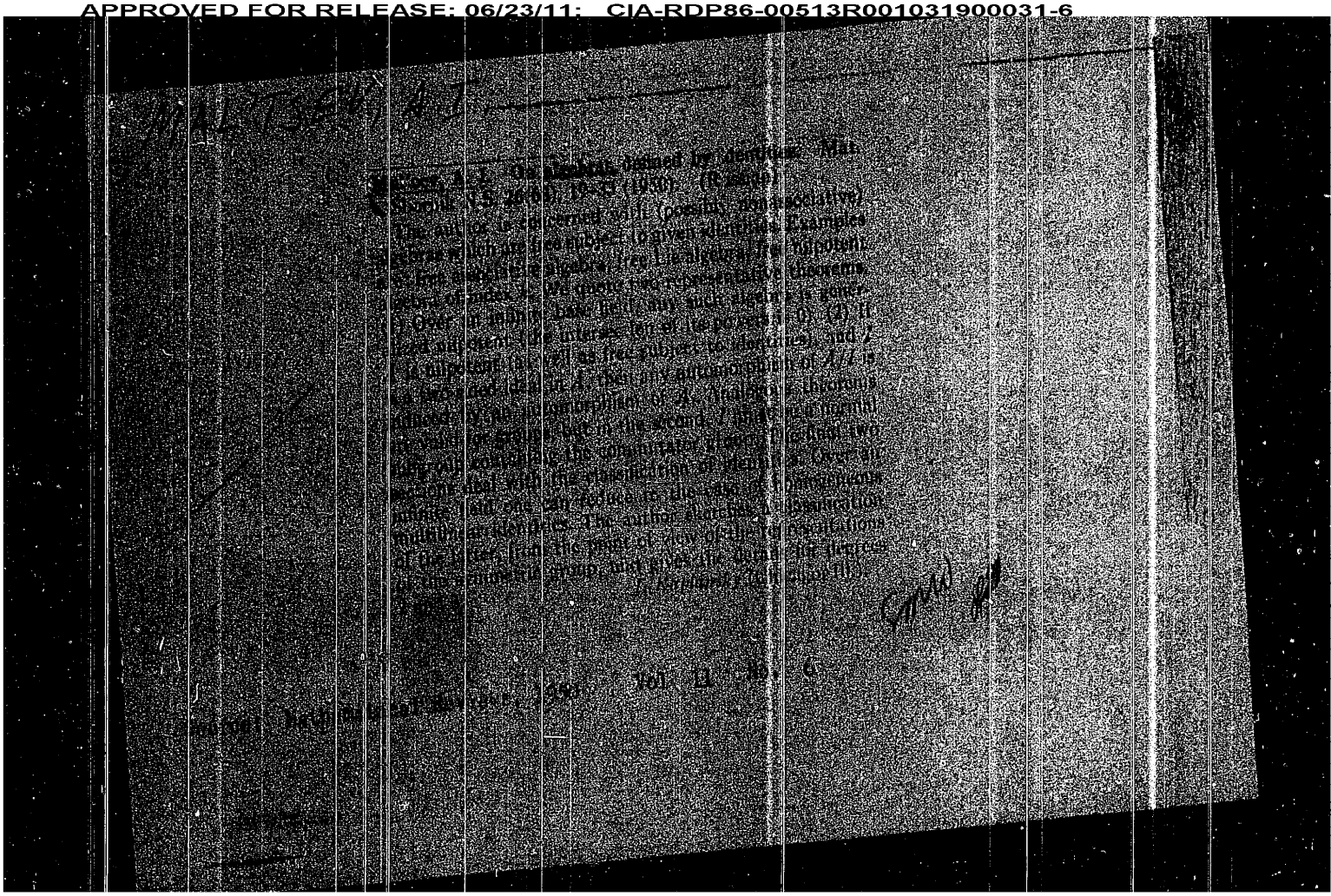
MAL'TSEV, A.I.

*Mal'cev, A. I. On the completion of group order. Trudy Mat. Inst. Steklov., v. 38, pp. 173–175. Izdat. Akad. Nauk SSSR, Moscow, 1951. (Russian) 20 rubles.

Generalizing theorems of H. Šimbireva [Mat. Sbornik 2(62), 145–178 (1947); these Rev. 8, 563] and A. A. Vinogradov [Partial orderability and structural orderability of groups, Thesis, Moscow, 1949 (unavailable)], the author proves that in every locally nilpotent partially ordered group without elements of finite order the order can be expanded to the whole group. H. Freudenthal.

MATHEMATICAL REVIEWS (Unclassified)
Vol. 14, No. 1, January 1953, pp. 1-120

MATHEMATICAL REVIEWS (Unclassified)
Vol. 14, No. 1, January 1953, pp. 1-120



1. MAL'TSEV, A. I.

2. USSR (600)

4. Physics and Mathematics.

7. Course in Advanced Algebra. By A. G. Kurosh. (Second edition, Moscow-Leningrad, State Technical Press, 1950). Reviewed by A. I. Mal'tsev. Sov. Kniga, No. 12, 1950.

9. [redacted] Report U-3081, 16 Jan. 1953. Unclassified.

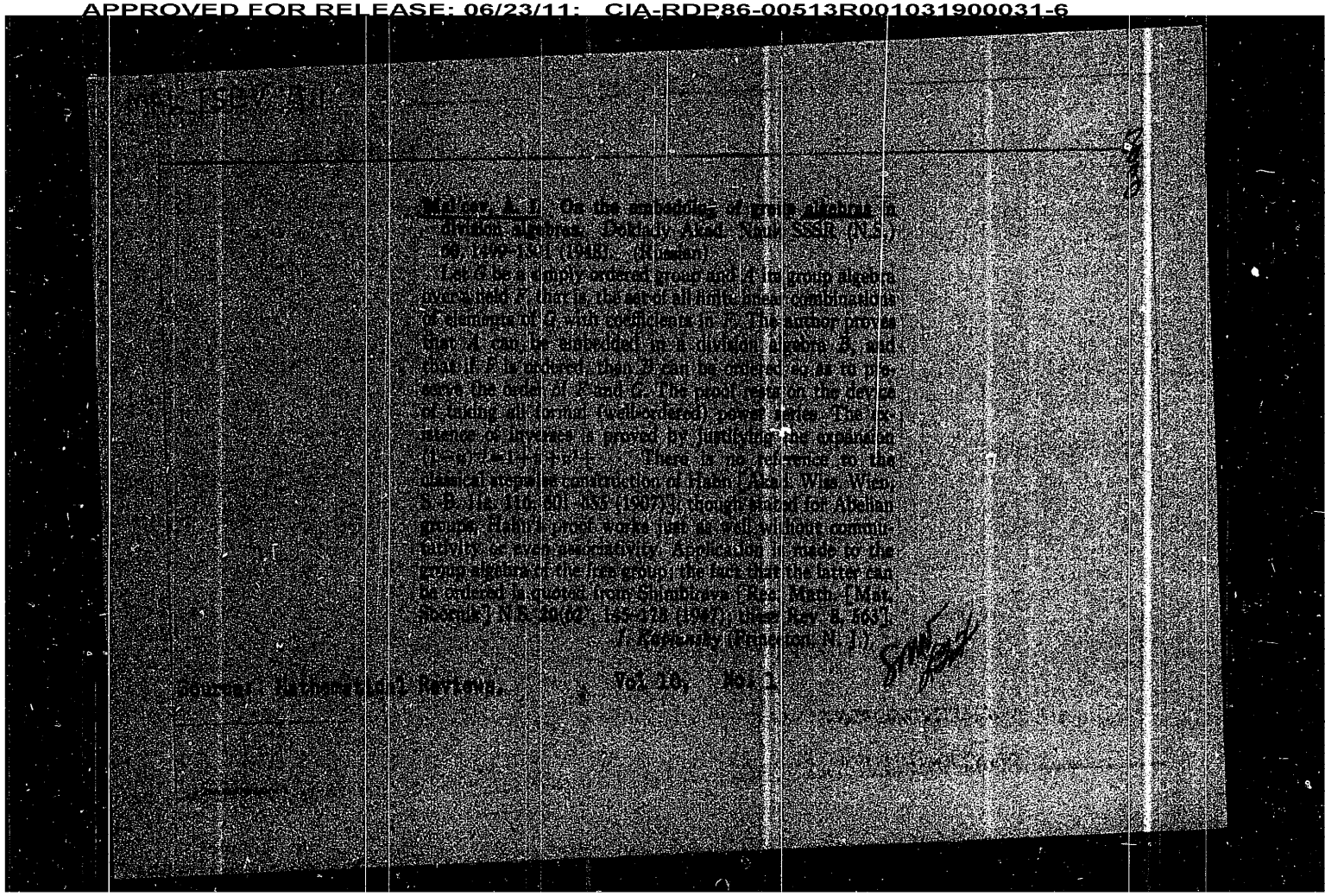
MAL'TSEV, A.I.

19749 - MAL'TSEV, A. I. O veskonechnykk razreshimykh gruppakk, doklady Akad. nauk SSSR, novaya seria, T. LXVII, No. 1, 1949, S. 23-25

SO: LETOPIS' ZHURNAL STATEY, Vol. 37, MOSKVA 1949

37149. Ob uporya dochennykh gruppakh. Izvestiya akad. Nauk SSSR, seriya matem. 1949, No. 6, s. 473-82 --- Bibliogr: 8 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol 7, 1949



Malcev, A. I. On the embedding of group algebras in division algebras. Doklady Akad. Nauk SSSR (N.S.) 60, 1499-1501 (1948). (Russian)

Let G be a torsion-free ordered group and F its group algebra over a field K (that is, the set of all finite linear combinations of elements of G with coefficients in K). The author proves that A can be embedded in a division algebra B, and that if F is ordered, then B can be ordered so as to preserve the order of F and G. The proof rests on the device of taking all formal (well-ordered) power series. The existence of inverses is proved by justifying the expansion $(1-a)^{-1}=1+a+a^2+\cdots$. There is no reference to the classical negative construction of Hahn [Akad. Wiss. Wien, S.-B. IIa, 116, 601–655 (1907)], though natural for Abelian groups. Hahn's proof works just as well without commutativity or even associativity. Application is made to the group algebra of the free group; the fact that the latter can be ordered is quoted from Shimbireva [Rec. Math. [Mat. Sbornik] N.S. 10(52), 119–132 (1942); these Rev. 4, 163]. I. Kaplansky (Chicago, Ill.)

Source: Mathematical Reviews. Vol. 10, No. 1

The concept of rank [Prüfer, Math. Z. 20, 165–187 (1924)] is extended from commutative to noncommutative groups in two ways. The general rank R of a group $\mathfrak{G}$ is defined to be the least positive integer (or ∞) with the property that every finite subset of $\mathfrak{G}$ lies in a subgroup of $\mathfrak{G}$ with R generators. The special rank r is defined by replacing "lies in" by "generates." In the non-Abelian case these may differ, as in the free group of n generators, where $R=n$ and $r=\infty$. The author shows that not all groups of finite general rank are at most countable. However, if $\mathfrak{G}$ is isomorphic to a group of n by n matrices with entries in a field K, then $\mathfrak{G}$ is at most countable. He proves this by appending to the simple field P of K all the entries of all the matrices which represent $\mathfrak{G}$ to obtain a new field Q which he then closes algebraically, using a result of Steinitz [J. Reine Angew. Math. 137, 167–309 (1910)]. From this it turns out that Q, and consequently $\mathfrak{G}$, are countable. A consequence of this result is that every locally free group [Kurosch, C. R. (Doklady) Acad. Sci. URSS (N.S.) 24, 99–101 (1939); these Rev. 2, 127] of finite general rank is countable.

F. Haimo (St. Louis, Mo.)

Source: Mathematical Reviews, Vol. 9 No. 7

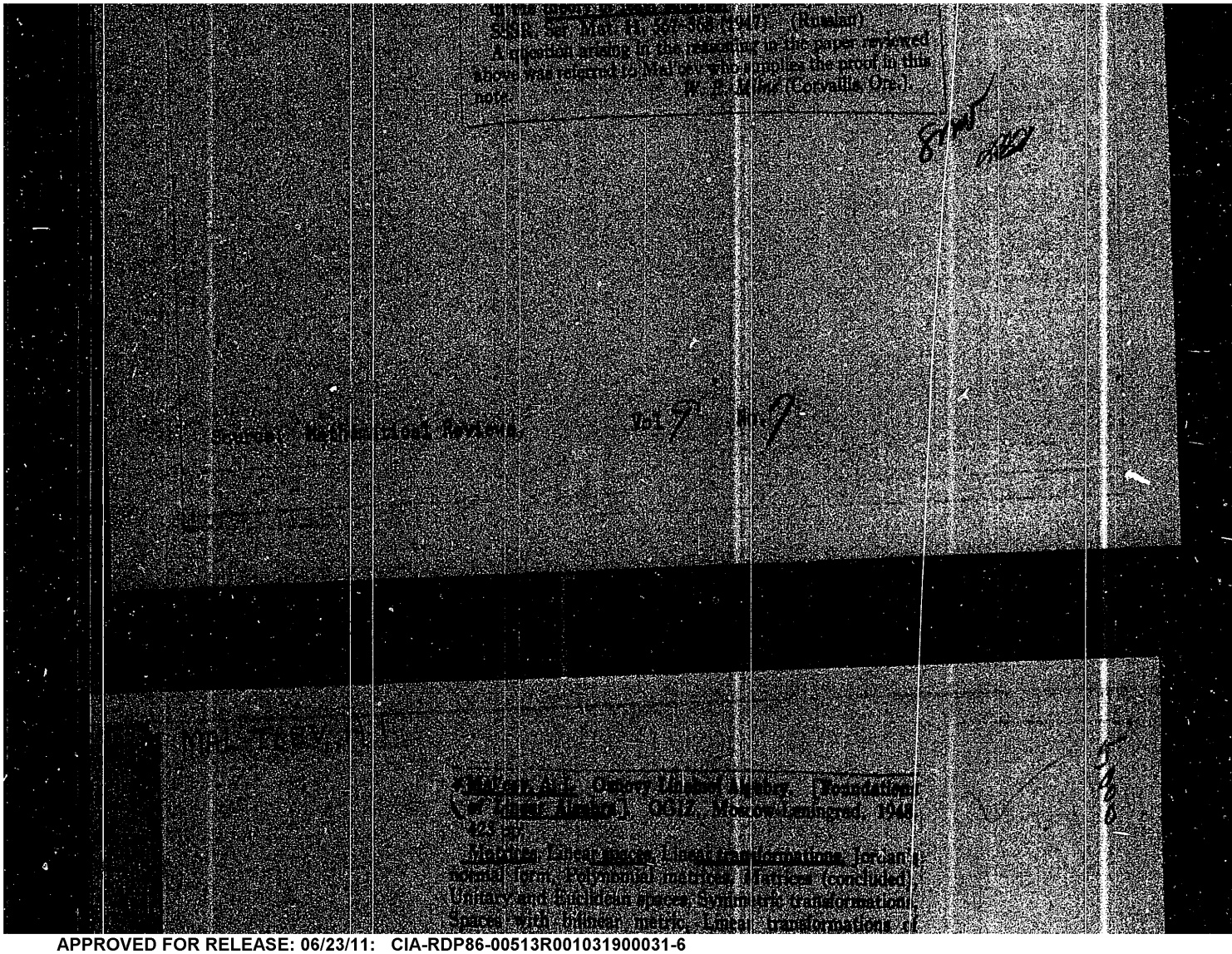
Unitary and Euclidean spaces. Symmetric transformations. Spaces with bilinear metric. Linear transformations of bilinear-metric spaces. *Table of contents.*

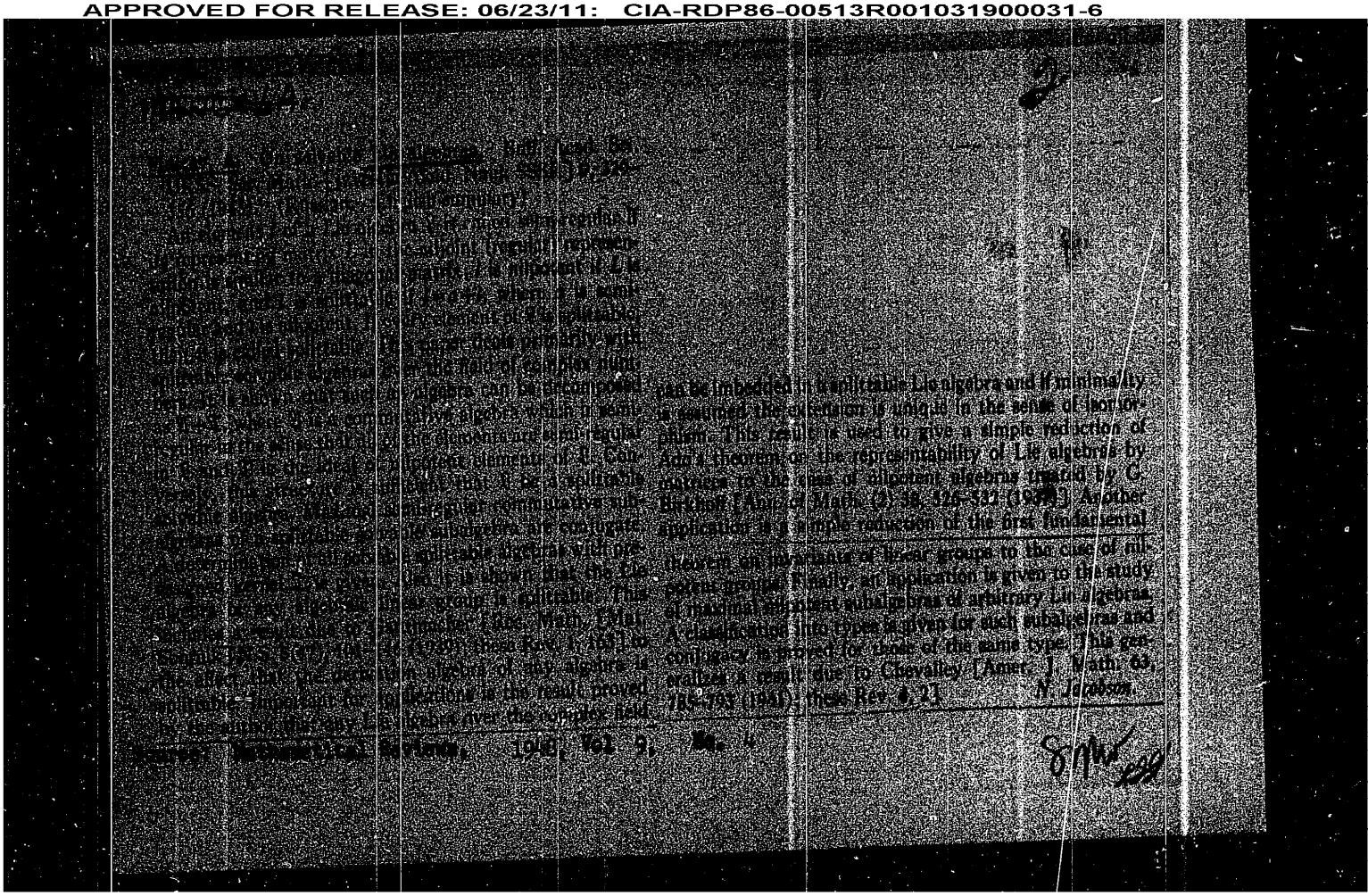
Source: Mathematical Reviews, 1950 Vol. 11 No. 6

7-8-64

Mal'cev, A. I. On groups of finite rank. Mat. Sbornik N.S. 22(64), 351-352 (1948). (Russian)

The concept of rank [Prüfer, Math. Z. 20, 165-18 (1924)] is extended from commutative to noncommutative groups in two ways. The general rank R of a group G is





can be imbedded in a solvable Lie algebra and if minimality is required, the extension is unique in the sense of isomorphism. This result is used to give a simple reduction of Ado's theorem on the representability of Lie algebras by matrices to the case of nilpotent algebras treated by G. Birkhoff [Ann. of Math. (2) 38, 526-532 (1937)]. Another application is a simple reduction of the first fundamental theorem on invariants of linear groups to the case of nilpotent groups. Finally, an application is given to the study of maximal nilpotent subalgebras of arbitrary Lie algebras. A classification into types is given for such subalgebras and conjugacy is proved for those of the same type. This generalizes a result due to Chevalley [Amer. J. Math. 63, 785-793 (1941); these Rev. 3, 23].

N. Jacobson

MAL'TSEV, A. I.

"Orthogonal and Symplectic Representations of Semi-Simple Lie Groups," Dok AN, 41, No 8, 1943.

Steklov Math. Inst., AS USSR

MAL'TSEV, A. I.

"On the Representation of an Algebra as a Direct Sum of the Radical and a Semi-Simple Subalgebra," Dok AN 36, No 2, 1942

MAL'TSEV, A. I.

"Subgroups of Lie Groups in the Large," Dok AN 36, No 1, 1942

Steklov Math. Inst., AS USSR

MAL'TSEV, A.I.

"On the Simple Connectedness of Invariant Subgroups of Lie Groups," Dok AN 34, No 1, 1942.

Inst. Math.,AS USSR

MAL'TSEV, A. I.

Untersuchungen aus dem Gebiete der mathematischen logik. Matem. SB., 1(43) (1936), 323-336.
On the immersion of an algebraic ring into a field. Math. Ann., 113(1937), 686-691.
Abelevy Gruppy konechnogo ranca bel krucheniya. Matem. SB., 4(46), (1938) 45-68.
O vklyuchnii assotsiativnykh sistem v gruppy. Matem. SB., 6(48), (1939), 331-336.
O vklyuchenii assotsiativnykh sistem v gruppy. II Matem. SB., 8(50), (1940) 251-264.
Ob izomopfnom predstavlenii Beskonechnykh grupp matritsami. Matem. SB. 8(50), (1940) 405-422.
Ob odnom obshchem metode polucheniya teorem teorii grupp. Ivanovo, uchen. ZAP. Ped. In-ta, FIZ.- Matem. FAK-T, 1:1 (1941), 3-9.
I razkizgebuu akgebry v pryamuyu summu radikala i poluprostoy podalgebry. DAN, 36(1942), 46-50.
O predstavleniyakh Beckonechnykh algebr. Matem. SB., 13(55), (1943), 263-286.
O lokal'nykh i polnykh topologicheskikh gruppakh. DAN, 32 (1941), 606-608.
Ob odnosvyaznosti normal'nykh deliteley grupp lic. Dan, 34 (1942) 12-15.
Podgruppy grupp lie v tselom. DAN, 36 (1942), 5-8.
O strukture grupp lie v tselom. DAN, 37 (1942), 3-6.
O lineynykh svyazhykh lokal'no-zamknutykh gruppakh. DAN, 40 (1943), 108-110.
O poluprostykh podgruppakh grupp. IAN, Ser. Matem. 8(1944), 143-174.
On the theory of the lie groups in The Large. Matem. SB., 16(58), (945), 163-190.
O razreshimykh algebrakh li. IAN, Ser. Matem., 9(1945), 329-356.

YUROVSKIY, Ya.I.; MAL'TSEV, A.I.; SOLDATKINA, V.D.; GROMOV, G.I.; SILAYEVA, A.S.; SHULEYKIN, A.S.; NEUSTROYEVA, V.V.; YUROVSKIY, Ya.I., red.

[Agricultural mapping of the area of a collective and state farm agricultural administration (an administrative region)] Sel'skokhoziaistvennoe kartografirovanie territorii proizvodstvennogo kolkhozno-sovkhoznogo upravleniia (Administrativnogo raiona). Moskva, Nedra, 1965. 46 p. (MIRA 18:5)

YUROVSKIY, Yakov Iosifovich, dots.; MAL'TSEV, Aleksey Ivanovich; SOLDATKINA, Valentina Dmitriyevna; GROMOV, Gennadiy Il'ich; SILAYEVA, L'bina; SHULEYKIN, Aleksandr Sergeyevich;

[Agricultural mapping of a demonstration farm] Sel'skokhoziaistvennoe kartografirovanie oporno-pokazatel'nogo khoziaistva. Moskva, Gosgeoltekhizdat, 1963. 37 p.
(MIRA 17:6)

MAL'TSEV, Aleksandr Ivanovich, akademik; ZAYEV, P.P., prof.; FEDOSEYEVA, M.P., dots.; KUSOVNIKOV, Ye.N., red.; BARANOVA, L.G., tekhn. red.

[Weeds of the U.S.S.R. and their control] Sornaia rastitel'nost' SSSR i mery bor'by s nei. Izd.4., perer. i dop. P.P. Zaevym i M.P.Fedoseevoi. Leningrad, Sel'khozizdat, 1962. 268 p. (MIRA 16:6)

(Weed control)

MAL'TSEV, A.G.

Diffuse fibromembranous lesion of the respiratory tract in pregnancy. Vest. oto-rin. 16 no.4:85-86 Jl-Ag '54. (MLRA 7:8)

1. Iz kliniki bolezney ukha, gorla i nosa Sverdlovskogo meditsinskogo instituta i III Sverdlovskoy gorodskoy infektsionnoy bil'nitsy.

(PREGNANCY, complications,
*diffuse fibre-membranous lesions of resp. tract)
(RESPIRATORY TRACT, diseases,
*fibro-membranous lesions in pregn.)

3-58-3-23/32

The International Relations of the Higher School. A Plan for Scientific and Cultural Cooperation for 1958

cialists to increase their scientific and special qualifications. Historians of Yugoslavia and the USSR will visit each other to become familiar with the development of historical science and archive matters.

AVAILABLE: Library of Congress

Card 3/3

The International Relations of the Higher School. A Plan for Scientific and Cultural Cooperation for 1958.

in conducting research in the field of physics of solids, electronics and mechanics. An exchange of professors and instructors, who are to deliver lectures and reports, will take place. The AS USSR, the Vsesoyuznaya akademiya sel'skokhozyaystvennykh nauk imeni V.I. Lenina (All-Union Agricultural Academy imeni V.I. Lenin), and other institutions, will give help to the scientific institutions of Albania in solving problems of selection and seed growing. An exchange of information on forthcoming conferences and an exchange of scientific and instructional literature, etc., will take place. Many scientific workers and instructors from Bulgaria will defend their dissertations at Soviet vuzes. Some of the measures agreed upon with Albania are also applicable to Bulgaria and the other People's Democracies. Combined commissions of Chinese and Soviets will compile new textbooks for Chinese and Soviet vuzes. Poland will send and receive, several groups of students who will undergo practical training at enterprises, institutions, kolkhozes and sovkhozes. Yugoslavia will also carry out an exchange of instructors. The Soviet higher schools will receive a group of Yugoslav spe-

AUTHOR: Mal'tsev, A.F. 3-58-3-23/32

TITLE: The International Relations of the Higher School (Mezhdunarodnyye svyazi vysshey shkoly) A Plan for Scientific and Cultural Cooperation for 1958 (Plan nauchnogo i kul'turnogo sotrudnichestva na 1958 god)

PERIODICAL: Vestnik Vysshey Shkoly, 1958, Nr 3, pp 79 - 81 (USSR)

ABSTRACT: This article deals with plans for cultural and scientific relations between the higher schools of the USSR and the People's Democracies. The following measures are planned: Albania will effect an exchange of student groups in the 1958/59 school year. Several scientific workers of Soviet universities will proceed to Albania to become familiar with instructional and scientific research work at the Tirana University. Direct contact will be established between the Azerbaydzhanskiy universitet imeni S.M. Kirova (Azerbaydzhan University imeni S.M. Kirov) and the first Albanian university. The Akademiya nauk SSSR (USSR Academy of Sciences) will assist the Tirana university in conducting scientific research work for exploiting Albania's natural resources. Moscow University scientists will assist the Tirana Univer-

Card 1/3

immediate measures for the creation of Chinese school books. During the August conference a course was organized dealing with the general education of students in accordance with their special capacities and tendencies. Nanking University for example selects two groups of student physicists, one of them to become scientific researchers, (selected from the more talented students), the other one to be practicing physicists. The development of higher schools entailed also an increase in the teaching staffs. At the beginning of the 1956/57 school term there were 58,000 vuz teachers, among them 4,500 professors and 3,400 dotsents. Teachers are needed in particular in the disciplines of general theory and techniques. Therefore the training of teachers in vuzes is now organized to an advanced degree. Many young teachers were sent to the Soviet Union and other Peoples' Democracies for training, and Soviet professors and dotsents went to China for this purpose.

From 1949 - 1957 more than 280,000 specialists in national economy were graduated. Evening and correspondence courses were introduced in 1956/57 in order to speed up education.

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Card 5/5

that the teaching staff lacked the necessary experience for the solution of scientific and methodic problems.

The realization of the instructions set by the Ministry of Higher Education created many difficulties, mainly because the students were overloaded with work and had no time for independent work. This was eliminated through the reduction of compulsory lectures, which permitted students to plan their own schedule. The study of foreign languages increased; at the Shanghai Polytechnical Institute, 40% of the students learn Russian. Seminary work has also increased. Teachers have more time to prepare lectures. These activities are considered to be a main part of the 12-year plan for the development of science and technology in the Chinese People's Republic. Discussions also took place on the type of specialist to be trained in higher schools. There are also different views relating to lectures of special and general technical disciplines. The problem of Chinese textbooks is being dealt with, as many of the existing manuals were translated from Russian, English, German etc. and often do not comply with Chinese conditions. Therefore the Ministry of Higher Education and other ministries took

new teaching plans and programs with the main emphasis on very close connection between theory and practice and the improvement of educational methods.

Previously, no chairs existed in the Chinese vuzes; what they had were study groups. At present, the main link in the vuzes is the chair where the whole educational, methodic and scientific work is concentrated. The chairs in turn are component parts of faculties. In every vuz, councils were created in order to support the management in the organization of vuz life.

In 1956/57 the vuzes entered the second stage of their development through the improvement of teaching methods and the expansion of scientific research. A meeting of vuz directors and instructors took place in August 1956, during which the good results of the reorganization were reported and additional new projects were introduced to improve vuz activity. Prior to the conference a thorough inspection was performed which showed, that in spite of measures taken the students are still overburdened with school work and that their knowledge was insufficient; that the theory of education was not always related close enough to practice; that frequent meetings and sessions took too much time;

A New Stage in the Development of Chinese Higher Schools 3-7-25/29

During the last several years a 5-year training period was fixed for many schools and it is planned to introduce the same in all higher educational institutions. New vuzes have also been established in remote areas such as the Sintsian province, in the north-west, south-west, and in the maritime regions. In addition higher education institutions that never existed in China were opened such as polytechnical, mining, metallurgical, geological, aviation, construction, chemical, forestry, agricultural institutes etc. During the second five-year plan (1958 - 1962) vuzes will also be established in the new economic areas including Tibet.

The number of vuz students is increasing every year and exceeded 400,000 during the 1956/57 school year. After 1957 students will be admitted into vuzes on the basis of competitions, when nearly two applicants are expected for every vacancy. New vuz settlements were constructed comprising living, educational and sports facilities. The laboratories were well equipped with precision apparatus and material. After 1952-1956, the Ministries of Higher Education, Culture, Public Health and Education developed

Card 2/5

AUTHOR: Mal'tsev, A. F. 3-7-25/29

TITLE: A New Stage in the Development of Chinese Higher Schools (Novyy etap razvitiya vysshey shkoly Kitaya)

PERIODICAL: Vestnik Vysshey Shkoly, 1957, # 7, pp 83-89 (USSR)

ABSTRACT: The author describes the development of Chinese higher education, which he was able to observe during a visit to China. After 1949, the Chinese Communist Party and the People's Government had to deal with the difficult task of training qualified specialists for the economic and cultural reorganization of the country. First of all, the existing higher educational institutions had to be opened to the working class, in order to form a new "intelligentsia".

In 1950, there were 180 higher educational institutions where about 170,000 students were trained, and 20 of these institutions were subsidized by foreign governments. After the liberation, the existing universities were reorganized and expanded, and separate technical, agricultural, medical and other institutes were created, in the majority of which training periods of 4 years were established.

Card 1/5

MAL'TSEV, A.A., kand.fiz.-matem.nauk; PETROV, A.A., kand.fiz.-matem.nauk

Conferences of mathematicians at Tashkent and Tvilisi. Vest. AN SSSR 34 no. 2:114-116 F '64. (MIRA 17:5)

16(1)

AUTHOR: Mal'tsev, A.A. SOV/20-126-4-5/62

TITLE: Duality Theorem for Not Closed Sets in Manifolds

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 4, pp 709-712 (USSR)

ABSTRACT: Theorem: Let M^n be an orientable n-dimensional homological manifold acyclic in the dimensions q and q+1 over an arbitrary coefficient domain. Then the groups $\nabla^p A$ and $\nabla^q B$, where p and q are non-negative integral, p+q = n-1, are mutually isomorphic for every $A \subset M^n$ and $B = M^n \setminus A$.
The proof follows from the considerations of K.A.Sitnikov on the dualisability of the group of stong homologies.
There are 2 Soviet references.

ASSOCIATION: Matematicheskiy institut imeni V.A.Steklova Akademii nauk SSSR (Mathematical Institute imeni V.A.Steklov AS USSR)

PRESENTED: February 24, 1959, by P.S.Aleksandrov, Academician

SUBMITTED: February 19, 1959

Card 1/1

MAL'TSEV, A. A. Cand Phys-Math Sci -- (diss) "A new homologous dimensional invariant for open ~~numbers~~ spaces." Mos, 1959. Cover, 4 pp (Mathematics Inst im V. A. Steklov, Acad Sci USSR), 150 copies (KL, 52-59, 116)

MAL'TSEV, A., akademik.

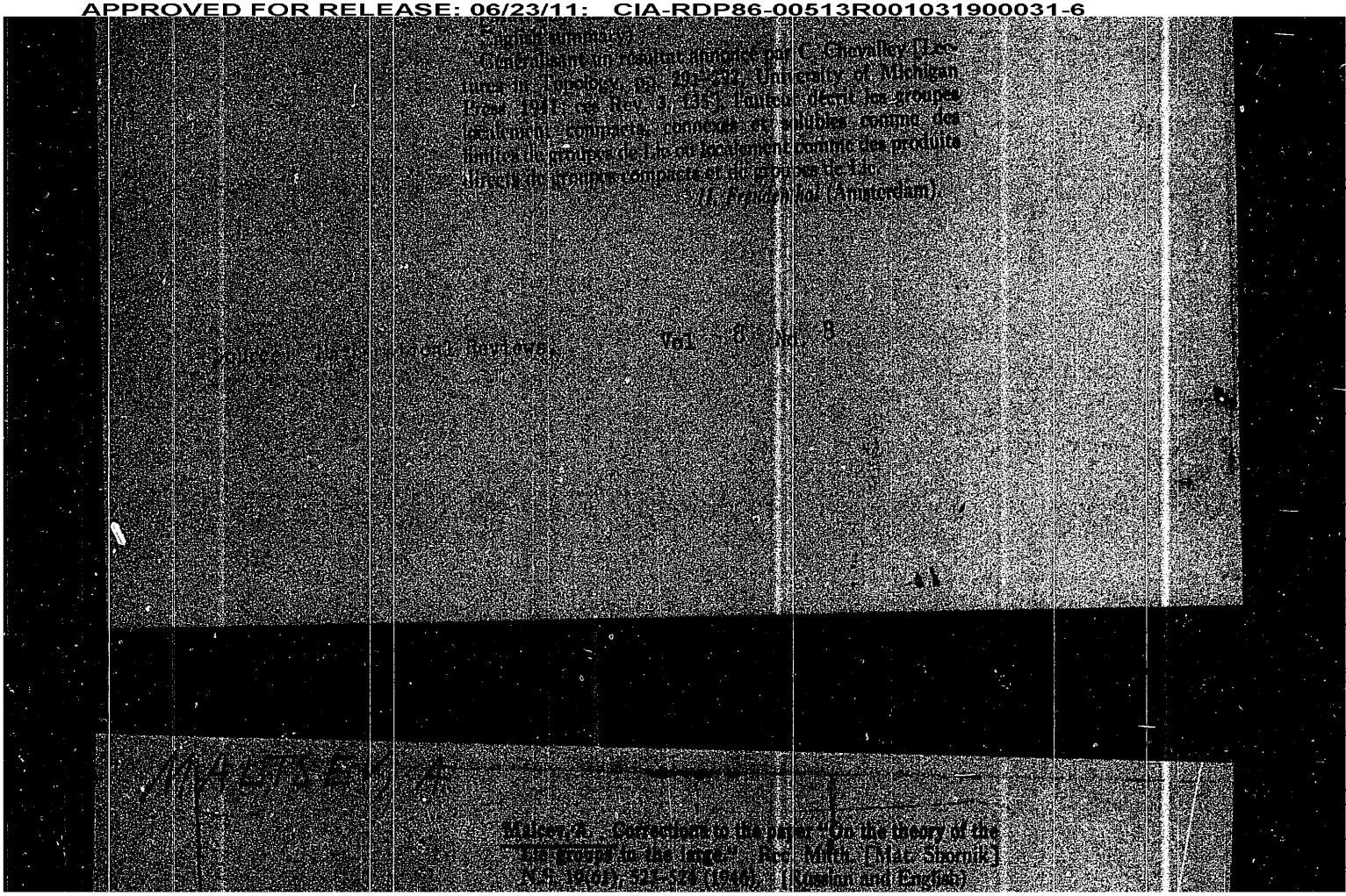
Defining correlations in categories. Dokl. AN SSSR 119 no.6:1095-1098 Ap '58. (MIRA 11:6)

(Topology)

...tic groups in the large". Rec. Math. [Mat. Sbornik] N.S. 10(61), 521–524 (1940). [Russian and English]

[The paper appeared in the same Rec. (N.S.) 16(58), 163–190 (1945). The author corrects the errors noted in these Rev. 7, 176.

Source: Mathematical Reviews, Vol 8 No. 6



1. Kafedra fizicheskoy [illegible]
universitata.

Macey, A. On solvable topological groups. Rec. Math. [Mat. Sbornik] N.S. 19(61), 165–172 (1946). (Russian. English summary)

SHEVEL'KOV, V.F.; MAL'TSEV, A.A.

Electron emission and absorption spectra of vapors of oxygen compounds of gallium and indium. Teplofiz. vys. temp. 3 no.3:486-487 My-Je '65. (MIRA 18:8)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

CHERNIN, S.M.; MAL'TSEV, A.A.

Graphite source of infrared rays. Prib. i tekh. eksp. 9 no.4: 188-190 Jl-Ag '64. (MIRA 17:12)

1. Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.

ACCESSION NR: AP4044532

the maxima at 950, 770, and 680 cm^{-1} coincide with the oscillation frequency of the double-atom molecules AlO, GaO, and InO. The absorption results show that the linear geometrical configurations of Al_2O and Al_2S depart from the angular configurations of Ga_2O and In_2O. "The authors express their gratitude to GOI colleague V. I. Baykov and to K. P. Vasilevskiy for allowing them to use their instruments and for their help." Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 04May64

SUB CODE: OP

NO REF SOV: 010

ENCL: 00

OTHER: 011

Card 2/2

S/0294/64/002/004/0650/0653

ACCESSION NR: AP4044532

AUTHORS: Mal'tsev, A. A.; Shevel'kov, V. F.

TITLE: Infrared absorption spectra of Al_2O, Ga_2O, In_2O, and Al_2S molecules

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 4, 1964, 650-653

TOPIC TAGS: absorption band, absorption spectrum, aluminum oxide, indium, gallium, oscillation/GOI instrument, MGU instrument

ABSTRACT: The absorption spectra of aluminum, gallium, and indium suboxides together with aluminum subsulfide were studied experimentally in their vapor phase. The spectra were measured on the GOI instrument in the wavelength region 230-600 cm^{-1} in Professor B. S. Neporent's laboratory and in the region 600-2000 cm^{-1} on the MGU instrument of the faculty of chemistry. The Al_2O_3 + 4Al mixture shows only one absorption band with a maximum at 950 cm^{-1}. In the Ga_2O and In_2O spectra three absorption bands are noticeable: 420, 770, 1140 cm^{-1} for gallium oxide and 360, 580, 940 cm^{-1} for indium oxide. Finally, Al_2S_3 + 4Al shows one wide absorption band at 430 cm^{-1}. In the Al_2O, Ga_2O, and In_2O absorption bands

Card 1/2

L 12592-63
ACCESSION NR: AF3001601

tions of boronmonoxide lead to the assumption that both are polymers. The similarity of the spectrum of the brown modification with that of boric anhydride indicates that the brown boronmonoxide is a mixture of boric anhydride with boron, which was confirmed by experiment. Orig. art. has: 5 formulas, 2 charts, and 1 table.

ASSOCIATION: Moskovskiy universitet, kafedra fizicheskoy khimii (Moscow University, Department of Physical Chemistry)

SUBMITTED: 27Dec62 DATE ACQ: 09Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 000 OTHER: 016

Card 2/2

L 12592-63 EPR/EWP(j)/EPF(c)/EWT(m)/BDS ASD Ps-4/Pr-4/Pc-4
RM/WW

ACCESSION NR: AP3001601 S/0189/63/000/003/0014/0017

AUTHOR: Nikitin, V. S.; Mal'tsev, A. A.; Pchelkina, M. A.; Vinogradova, Z. F.

TITLE: Infrared spectrum of diborontetrahydroxide B sub 2 (OH) sub 4 and boronmonoxide (BO) sub x

SOURCE: Moscow. Universitet. Vestnik. Seriya 2. Khimiya, no. 3, 1963, 14-17

TOPIC TAGS: infrared spectrum, diborontetrahydroxide, boronmonoxide, polymer of boron

ABSTRACT: The study was undertaken to ascertain the frequencies characteristic for the B——B bond in infrared spectra of diborontetrahydroxide and boronmonoxide. A white modification of boronmonoxide was prepared by heating diborontetrahydroxide to 250-270C in a vacuum, and a brown modification obtained by further heating to 600-650C. By hydrolysis of the white boronmonoxide with heavy water a deuterium-substituted diborontetrahydroxide was obtained, which served to pinpoint the absorption lines of diborontetrahydroxide. The samples were suspended in vaseline oil or in hexachlorobutadiene and subjected to infrared spectroscopy. For diborontetrahydroxide the line at 1150 cm sup -1 was found to represent the B——B valency oscillation. The wide absorption lines of the white and brown modifica-

Card 1/2

[illegible]SEV, A.A.; LATVIYEV, V.K.; TATEVSKIY, V.N.

Nature of the "fluctuating bands of boric acid." Dokl. [illegible]
137 no. 1:123-125 Mr-Ap '61. (MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
Predstavleno akademikom V.N. Kondrat'yevym.
(Boric acid--Spectra)

MATVEYEV, V.K.; MAL'TSEV, A.A.; TATEVSKIY, V.M.

Intensity of the "fluctuating bands of boric acid" as a function of oxygen pressure. Vest. Mosk. un. Ser. 2: Khim. 16 no.1:51-53 Ja-F '61. (MIRA 14:4)

1. Kafedra fizicheskoy khimii Moskovskogo universiteta.
(Boric acid—Spectra)

Vibrational spectra of the B_2O_3 and .. S/051/61/011/006/004/012
E032/E114

molecule. The 993 cm^{-1} band in the spectrum of boron sulphide is due to the spectrum of liquid B_2S_3. It is suggested that in order to obtain more accurate values for the force constant and in order to increase the accuracy of the vibrational frequencies, more accurate spectroscopic studies are necessary in the region of 900 cm^{-1} where it is expected that there are bands due to antisymmetric BO vibrations.

There are 1 table and 17 references: 5 Soviet-bloc and 12 non-Soviet-bloc. The four most recent English language references read as follows:

Ref. 3: D. White, D.E. Mann, P.N. Walsh, A. Sommer, J.Chem.Phys., v.32, 481, 1960.

Ref.11: A. Sommer, P.N. Walsh, D. White, J.Chem.Phys., v.33, 296, 1960.

Ref.12: C.W.F.T. Pistorius, J.Chem.Phys., v.31, 1454, 1959.

Ref.16: J.L. Parsons, M.E. Milberg. J.Amer.Ceram.Soc., v.43, 326, 1960.

SUBMITTED: January 2, 1961

Card 3/3

S/051/61/011/006/004/012
E032/E114

Vibrational spectra of the B_2O_3 and

Vibration	Symmetry	$B_2^{10}O_3$	$B^{10}B^{11}O_3$	$B_2^{11}O_3$	$B_2^{10}S_3$	$B_2^{11}S_3$
ν_1	A_1	2084	2022	2015	1359	1306
ν_2	A_1	644	829	815	4[illegible]	909
ν_3	A_1	755	754	749	390	[illegible]
ν_4	A_1	161	161	160	[illegible]	[illegible]
ν_5	B_1	2097	2091	2029	1564	1511
ν_6	B_1	938	936	933	462	[illegible]
ν_7	B_1	682	668	668	345	[illegible]
ν_8	A_2	778	768	752	374	360
ν_9	B_2	700	685	673	351	351

The calculations show that the bands 1302 and 942 [illegible] observed in the infrared emission spectra [illegible] boric anhydride are due to the liquid phase [illegible]

Card 2/ 3

S/051/61/011/006/004/012
E032/E114

AUTHORS: Tatevskiy, M., Koptev, G.S., and Mal'tsev, A.A.

TITLE: Vibrational spectra of the B_2O_3 and B_2S_3 molecules

PERIODICAL: Optika i spektroskopiya, v.11, no.6, 1961, 724-729

TEXT: In a previous paper (A.A. Mal'tsev, V.N. Matveyev, V.M. Tatevskiy, DAN SSSR, v.137, 123, 1961) it was shown that the frequency of the antisymmetric BO vibration is about 900 cm^{-1}, while D. White, D.E. Mann, P.N. Walsh and A. Sommer (Ref.3: J.Chem Phys., v.32, 481, 1960) reported the figure of 1302 cm^{-1}. The aim of the present work was to explore the possible reasons for this discrepancy. The authors describe a calculation of the vibrational spectra of the $B_2^{10}O_3$ and $B_2^{11}O_3$ molecules, and have recalculated the spectra of $B^{10}B^{11}O_3$, $B_2^{10}S_3$ and $B_2^{11}S_3$. The calculated frequencies of bands in the vibrational spectra of $B_2^{10}O_3$, $B^{10}B^{11}O_3$, $B_2^{11}O_3$, $B_2^{10}S_3$ and $B_2^{11}S_3$ are shown in the following table:

Card 1/ 3

MAL'TSEV, A.A.; TATEVSKIY, V.M.

Interpretation of the infrared spectra of B_2O_3 and B_2S_3 molecules.
Opt. i spektr. 10 no.4:564 Ap '61. (MIRA 14:3)
(Boron oxide) (Boron sulfide)

A high-temperature furnace for ...

S/120/61/000/006/025/041
E032/E114

Ref.6: F.W. Paul,
Phys. Rev., v.49, 1959, no.2, 156.

ASSOCIATION: Khimicheskiy fakul'tet MGU
(Chemistry Division, MGU)

SUBMITTED: April 12, 1961

Card 4/4

The furnace does not incorporate any porous materials for insulation purposes, which is a definite advantage as compared with the furnace described by P.B. Zeeman (Ref.8: Canad. J. Phys., v.32, no.1, 1954, 9). The furnace has been used to investigate the emission spectra of AlS, AlC and SiO_2 and to investigate a new system of absorption bands in the spectrum of AlS (A.A. Mal'tsev, V.F. Shevel'kov, Ref.9: Optika i spektroskopiya, in press).

Acknowledgments are expressed to Ye.N. Ivanov, V.F. Shevel'kov, S.P. Alekhin and G.M. Merzlyakov for their assistance.

There are 2 figures and 9 references: 1 Soviet-bloc and 8 non-Soviet-bloc. The four most recent English language references read as follows:

Ref.1: L. Brewer, A.W. Searcy,
Annual Rev. Phys. Chem., v.7, 1956, 259.
Ref.2: J.L. Margrave,
Annual Rev. Phys. Chem., v.10, 1959, 457.
Ref.4: L.F.H. Bovey,
J. Scient. Instrum., v.32, 1955, 376.

Card 3/3

molybdenum. In addition there are the stainless steel screens 7. The latter are held in position by the four rods 8 which are screwed into the lid 10. The outer body 9 is in the form of a seamless steel tube (length 90 cm, diameter 31 cm). The current leads 4 and 5 pass through the lid 10 and are in the form of hollow copper tubes. They are insulated by the textolite bushes 12. The system is sealed by the rubber O-rings 13. The quartz viewing windows 14 are screened by the molybdenum screen 15 which can be operated from outside by the handle 16. Finally, there is a water jacket 18, and the required gas is introduced into the furnace through a special valve located on the lid 10. The system is pumped through a pipe let in through the lid 11. The furnace is supplied by a step-down transformer OSU-40/0.5 (OSU-40/0.5) and requires 40 kW. The maximum temperature at 40 kW is 3000 °C. A particular advantage of the device is the uniformity of the temperature distribution (the ends of the graphite heater differ by 800-1000 °C from the temperature at its mid-point). Another advantage is that the length of the heater can be varied. The maximum length is of the order of 50 cm.

Card 2/4

S/120/61/000/006/025/041
E032/E114

AUTHORS: Chernin, S.M., and Mal'tsev, A.A.

TITLE: A high-temperature furnace for studying the spectra of non-volatile compounds

PERIODICAL: Pribory i tekhnika eksperimenta, no.6, 1961, 120-122

TEXT: The authors describe a high-temperature hermetically sealed furnace incorporating a graphite heater and designed for the emission and absorption spectrometry of non-volatile compounds. It is claimed that this furnace is free of the disadvantages of other designs. Fig.1 shows a schematic drawing of the furnace. The graphite tubular heater 1 is held in position by the graphite plates 2 and the locknuts 3 (which are also made of graphite). The shape of the heater is designed so as to produce as uniform a temperature distribution as possible. The current is supplied through the water-cooled stout leads 4 and 5. In order to reduce heat losses the tubular heater is surrounded by a system of thin-walled screens 6 and 7. The first and second radial screens are made of graphite, the third and fourth of tantalum, and the fifth and sixth of

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S/051/60/009/006/004/018
E201/E191

An Investigation of the Electronic Spectra and the Isotopic Shift of Compounds of Boron and Oxygen. III. γ-Bands of the BO Molecule

the 1500-2090 Å region for $B^{11}O$ (the upper spectrum) and $B^{10}O$ (the lower spectrum). Fig.2 shows the 0--3 and 1--4 bands of the γ-system of BO. Tables 2 and 3 list the wave-numbers (in cm^{-1}) of the R_2-branch band edges of $B^{11}O$ (Table 2) and $B^{10}O$ (Table 3). The molecular potentials of BO are shown in Fig.3. It was found that the γ-system is due to the transition $C^2\Pi - X^2\Sigma^+$. A more accurate vibrational analysis of the spectrum was derived from the results and the vibrational constants of $B^{11}O$ and $B^{10}O$ were deduced (Table 4). A preliminary rotational analysis of five bands was carried out. Correlation between the electron states of BO and the atomic states of B and O was discussed. More accurate wave-lengths of the atomic lines of boron and silicon (1360-2090 Å) were obtained; they are listed in Table 1.

There are 3 figures, 3 tables and 31 references: 6 Soviet, 13 English, 4 German, 3 Dutch, 1 Swedish, 2 Swiss, 1 Indian, and 1 translation from English into Russian.

SUBMITTED: December 22, 1959

Card 2/2

24.6300

S/051/60/009/006/004/018
E201/E191

AUTHORS: Mal'tsev, A.A., Katayev, D.I., and Tatevskiy, V.M.

TITLE: An Investigation of the Electronic Spectra and the Isotopic Shift of Compounds of Boron and Oxygen. III. γ-Bands of the BO Molecule

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.6, pp 713-720

TEXT: The electronic spectrum of BO has three band systems: α-system in the 3100-8500 Å region, β-system in the 2100-3600 Å region, and γ-system discovered by Chretien and Miescher (Refs 15, 16) in the vacuum ultraviolet (1650-1860 Å), due to BO impurities in discharges in BF_3 mixed with helium. Extending their earlier studies (Refs 8,13), the present authors attempt to resolve contradictions in interpretation of the BO γ-bands by analysing the isotopic shift of band edges in samples enriched with B^{10}. A discharge tube with hot hollow cathode was used to excite the spectra of BO. A spectrograph ДФС-5 (DFS-5) was used to record the γ-bands of $B^{11}O$ and $B^{10}O$ in the 1600-2090 Å region. The wavelengths were found by comparing them with atomic lines of boron, silicon and carbon. Fig.1 shows the spectra obtained in

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S/051/60/009/004/002/034
E201/E191

The Isotopic Effect in Singlet Bands of the BF Molecule

the second and third give the frequencies (in cm^{-1}) of $B^{11}F$ and $B^{10}F$ molecules, respectively. The measured and calculated values of the isotope shift $\Delta\nu = \nu(B11) - \nu(B10F)$ are given in columns 4 and 5 respectively. The author deduced more accurate values of the $D^1\Pi$ state parameters, as well as preliminary values of the $E^1\Sigma^+$ state parameters ($T_e \approx 76\,955\ cm^{-1}$, $\omega_e' \approx 1630\ cm^{-1}$, $\omega_e'x_e' \approx 12\ cm^{-1}$).

There are 1 figure, 1 table and 10 references: 3 Soviet, 5 English and 2 Swiss.

SUBMITTED: December 31, 1959

Card 2/2

S/051/60/009/004/002/034
E201/E191

AUTHOR: Mal'tsev, A.A.

TITLE: The Isotopic Effect in Singlet Bands of the BF Molecule

PERIODICAL: Optika i spektroskopiya, 1960, Vol 9, No 4, pp 428-431

TEXT: The author studied 1300-2090 Å spectra of discharges in BF_3 of natural isotopic composition and in BF_3 enriched with B^{10} to the extent of 92%. For this purpose the author used a vacuum spectrograph ДФС-5 (DFS-5) with a 3 m concave diffraction grating of 2.8 Å/mm dispersion and a theoretical resolving power of 120 000. The experimental technique and the discharge tube were essentially the same as those used by Chretien et al. (Refs 1, 2). The spectra were recorded on Schumann-type plates made by Agfa. The singlet bands of $B^{11}F$ and $B^{10}F$ are shown in a figure on p 429 (1300-1850 Å). Apart from the bands reported by Chretien et al., the author found new bands in the $B^1\Sigma^+ - X^1\Sigma^+$, $C^1\Sigma^+ - X^1\Sigma^+$ and $D^1\Pi - X^1\Sigma$ systems, as well as a new system $E^1\Sigma^+ - X^1\Sigma^+$. All these bands are listed in a table on pp 430-431 where the first column gives the band,

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MAL'TSEV, A.A. ; DURAKOV, V.I.

Photoelectric spectral analysis of isotopes Li^6 and Li^7 by the standard mixture method. Izv.Sib.otd.AN SSSR no.3:122-123 '60.
(MIRA 13:10)

1. Moskovskiy gosudarstvennyy universitet i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.
(Lithium--Isotopes)

MAL'TSEV, A.A.; KORYAZHKIN, V.A.; MISYUREVICH, M.Ye.; TATEVSKIY, V.M.

Some modifications in the design of the recording system of the DFS-4 spectrophotometer to detect the isotope shift in the resonance line of lithium. Fiz.sbor. no.4:195-197 '58. (MIRA 12:5)

1. Khimicheskiy fakul'tet Moskovskogo ordena Lenina gosudarstvennogo universiteta imeni M.V.Lomonosova.

(Lithium--Spectra) (Spectrophotometer)

83635

S/081/60/000/015/001/014
A006/A001

Study of Electron Spectra and of the Isotopic Effect in Oxygen Boron Compounds. I. β -Bands of BO Molecules, II. "Boric Acid" Bands

fluctuation bands of the boric acid. This indicates the absence of hydrogen in the molecule composition giving rise to these bands. It is assumed that the fluctuation bands of the boric acid belong to the multi-atomic oxygen compound of boron, B_xO_y.

A. Mal'tsev

Translator's note: This is the full translation of the original Russian abstract.

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83635

S/081/60/000/015/001/014
A006/A001

Study of Electron Spectra and of the Isotopic Effect in Oxygen Boron Compounds. I. β-Bands of BO Molecules. II. "Boric Acid" Bands

can be explained by the inaccurate treating of experimental data by Sheibe. The method of least squares was used to recalculate Sheibe's data for the $X^2\Sigma$ state. In all bands spin doubling was observed.

II. Spectrographs with diffraction gratings were used to investigate emission fluctuation bands of boric acid, located in the 3700 - 6800 A range. The following spectrum sources were used: a discharge tube with a hot hollow cathode containing boron or boron-anhydride in an atmosphere of He and O_2 mixture, and an oxygen-hydrogen flame into which boric acid solution was introduced. At a high resolution the complicated rotational structure with several edges was observed for the majority of bands. The use of boron concentrated to 85% with a B^{10} isotope, allowed the determination of isotope band edges, shifted towards the short-wave side by about 6,5 and 5 A respectively for bands in the 5450 and 5750 A range. This result rejects Singh's theory (Singh, N.L., Proc. Indian Acad. Sci., 1949, Vol. A 29, p. 424) who relates the fluctuation bands of boric acid to the BO molecule. According to Singh the isotopic bands must be shifted to the long-wave side by 22 and 44 A respectively. When introducing to the spectrum source heavy water vapors, no isotopic effect is revealed in the

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83635

S/081/60/000/015/001/014
A006/A001

5.2400A

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 15, p. 15, # 60232

AUTHORS: Mal'tsev, A.A., Kuzyakov, Yu.Ya., Tatevskiy, V.M. (I)
Mal'tsev, A.A., Vinokurov, V.G., Tatevskiy, V.M. (II)

TITLE: Study of Electron Spectra and of the Isotopic Effect in Oxygen Boron Compounds. I. β-Bands of BO Molecules. II. "Boric Acid" Bands

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1957, No. 3 (8), pp. 475-480; 480-485

TEXT: I. АДФС-3 (DFS-3) spectrograph (2A/mm dispersion) was used to investigate the emission spectrum of BO β-bands ($B^2\Sigma - X^2\Sigma$ transition) in the arc and a discharge tube with a hot hollow cathode containing B_2O_3. Rotation analysis of 0 - 0, 0 - 1, 0 - 2, 0 - 3, 1 - 4, 1 - 5, 2 - 5, 2 - 6, and 3 - 4 bands was made, and by the method of least squares the following rotational constants (in cm^{-1}) of the $B^2\Sigma$ state were obtained: Be = 1.5192, α_e = 0.0210, $D_e = 7.4 \cdot 10^{-6}$ and $\beta_e = 2.0 \cdot 10^{-6}$. It is shown that divergence of Sheibe's rotational constant values (Sheibe, Z. Phys., 1930, Vol. 60, p. 74) with those of Djenkins and McKellar (Djenkins, McKellar, Phys. Rev. 1932, Vol. 42, p. 464)

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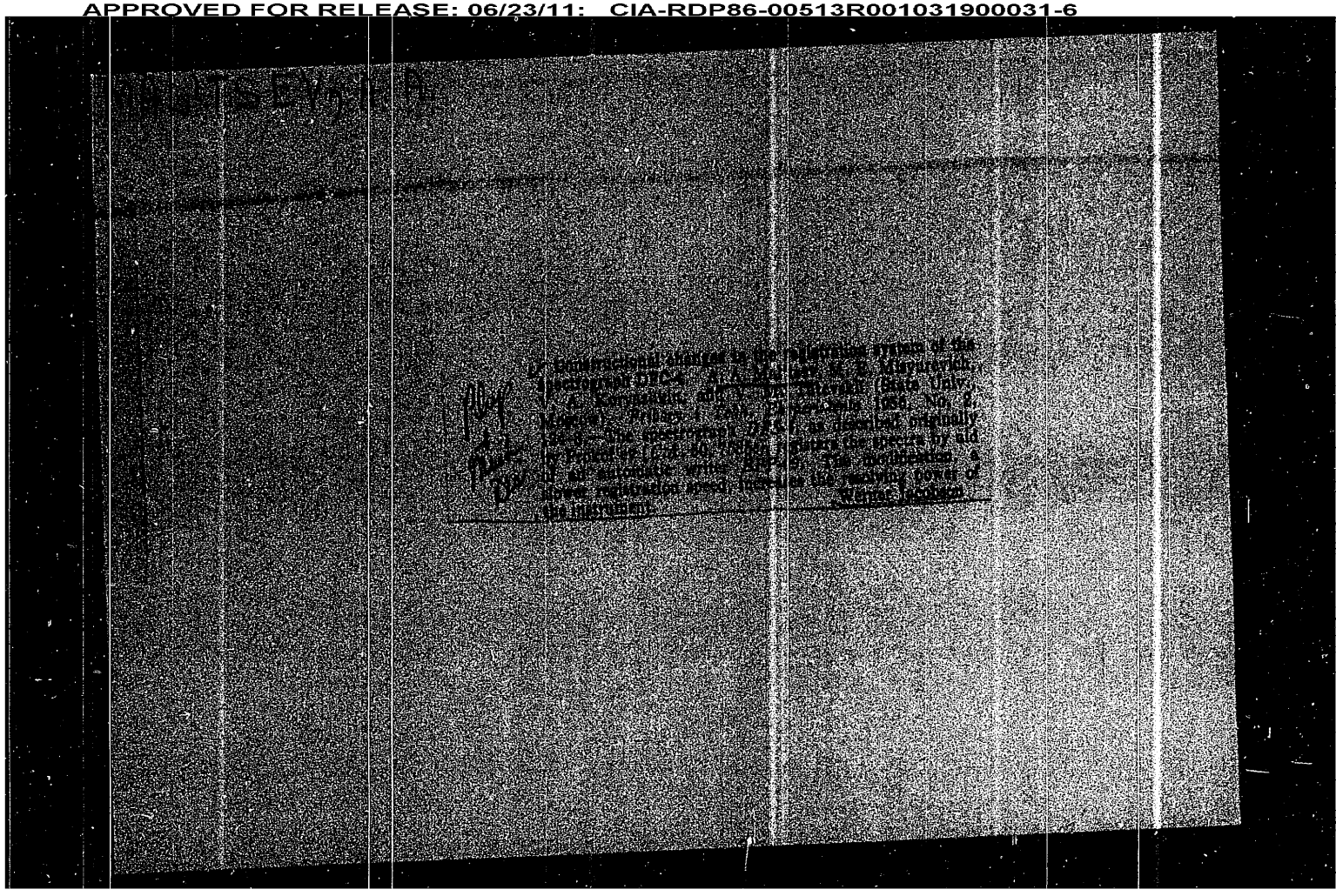
MAL'TSEV, A.A.; PROZOROVSKIY, Ye.A.; KORYAZHKIN, V.A.

Discharge tubes with cooled hollow-type cathodes. Prib. i tekh. eksp. no.1:117 Ja-F '57. (MIRA 10:6)

1. Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova.

(Electric discharges through gases)
(Spectrum analysis--Equipment and supplies)



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Lvov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii, 1956.
t. II: Atomnaya spektroskopiya (Materials of the 10th All-Union Conference on Spectroscopy, 1956. Vol 2: Atomic Spectroscopy) /Lvov/ Izd-vo L'vovskogo univ., 1958. 568 p. (Series: Its: Fizicheskiy sbornik, vyp.4(9)) 3,000 copies printed.

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PURPOSE: This book is intended for scientists and researchers in the field of spectroscopy, as well as for technical personnel using spectrum analysis in various industries.

COVERAGE: This volume contains 177 scientific and technical studies of atomic spectrography presented at the 10th All-Union Conference on Spectroscopy in 1956. The studies were carried out by members of scientific and technical institutes and include extensive bibliographies of Soviet and other sources. The studies cover many phases of spectroscopy: spectra of rare earths, electromagnetic radiation, physicochemical methods for controlling uranium production, physics and technology of gas discharge, optics and spectroscopy, abnormal dispersion in metal vapors, spectroscopy and the combustion theory, spectrum analysis of ores and minerals, photographic methods for quantitative spectrum analysis of metals and alloys, spectral determination of the hydrogen content of metals by means of isotopes, tables, and atlases of spectral lines, spark spectrographic analysis, statistical study of variation in the parameters of calibration curves, determination of traces of metals, spectrum analysis in metallurgy, thermochemistry in metallurgy, and principles and practice of spectrochemical analysis.

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Card 13/31

MAL'TSEV, A.A., inzh.

Testing of the working fluids for vibration dampers developed by the Kalinin Car Construction Plant. Sbor. trud. LIIZHT no.215:79-86 '64. (MIRA 17:12)

MAL'TSEV, A.A., inzh.

Investigating the working fluids of vibration dampers. Sbor. trud.LIIZHT no.183:95-103 '62. (MIRA 16:2)
(Damping (Mechanics)—Equipment and supplies)
(Railroads—Cars—Vibration)

MAL'TSEV, A. A.

Horses - Diseases

Etiological factors in the prevention and treatment of bronchopneumonia of colts. Veterinariia 29 no. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1952. Unclassified.

BUDINSKIY, Yaroslav [Budinsky, Jaroslav]; MAL'TSER, Rafail Yefimovich [translator]; BREMNEVA, K.M., red.; VEYTSMAN, G.I., red.; VENGRENYUK, L.I., red.; SHEFER, G.I., tekhn. red.

[Low-frequency transistor amplifiers] Usiliteli nizkoi chastoty na tranzistorakh. Izd.2., perer. Moskva, Mashgiz, 1963. 319 p. Translated from the Czech. (MIRA 16:10)
(Transistor amplifiers)

KUDRYASHOV, Yu.B.; MAL'TS, V.; GONCHARENKO, Ye.N.; KAKUSHKINA, M.L.; LOMSADZE, B.A.; SIN VEN'-DYUAN'; SYUE YUY-KHUA [Hsüeh Yü-hua]; CHZHAN CHZHEN'-LYAN'

Toxic effect of oleic acid and its oxidation products; cytotoxic factor in radiation injury of animals. Radiobiologiia 1 no.1:78-85 '61. (MIRA 14:7)

1. Moskovskiy gosudarstvennyy universitet, kafedra biofiziki.
(RADIATION--PHYSIOLOGICAL EFFECT)
(OLEIC ACID--TOXICOLOGY)

MAL'TS, V.

Formation of organic peroxides in the liver of rats irradiated with ionizing rays. Biofizika 5 no. 5:546-551 '60. (MIRA 13:10)

1. Biologo-pochvennyy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova.
(LIPIDS) (PEROXIDES) (GAMMA RAYS--PHYSIOLOGICAL EFFECT)